

# **An Overview of Speed Related Crashes**

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*North Carolina Executive Committee  
for Highway Safety*

**Seat Belt Working Group  
Initial Meeting**

**May 4, 2004**

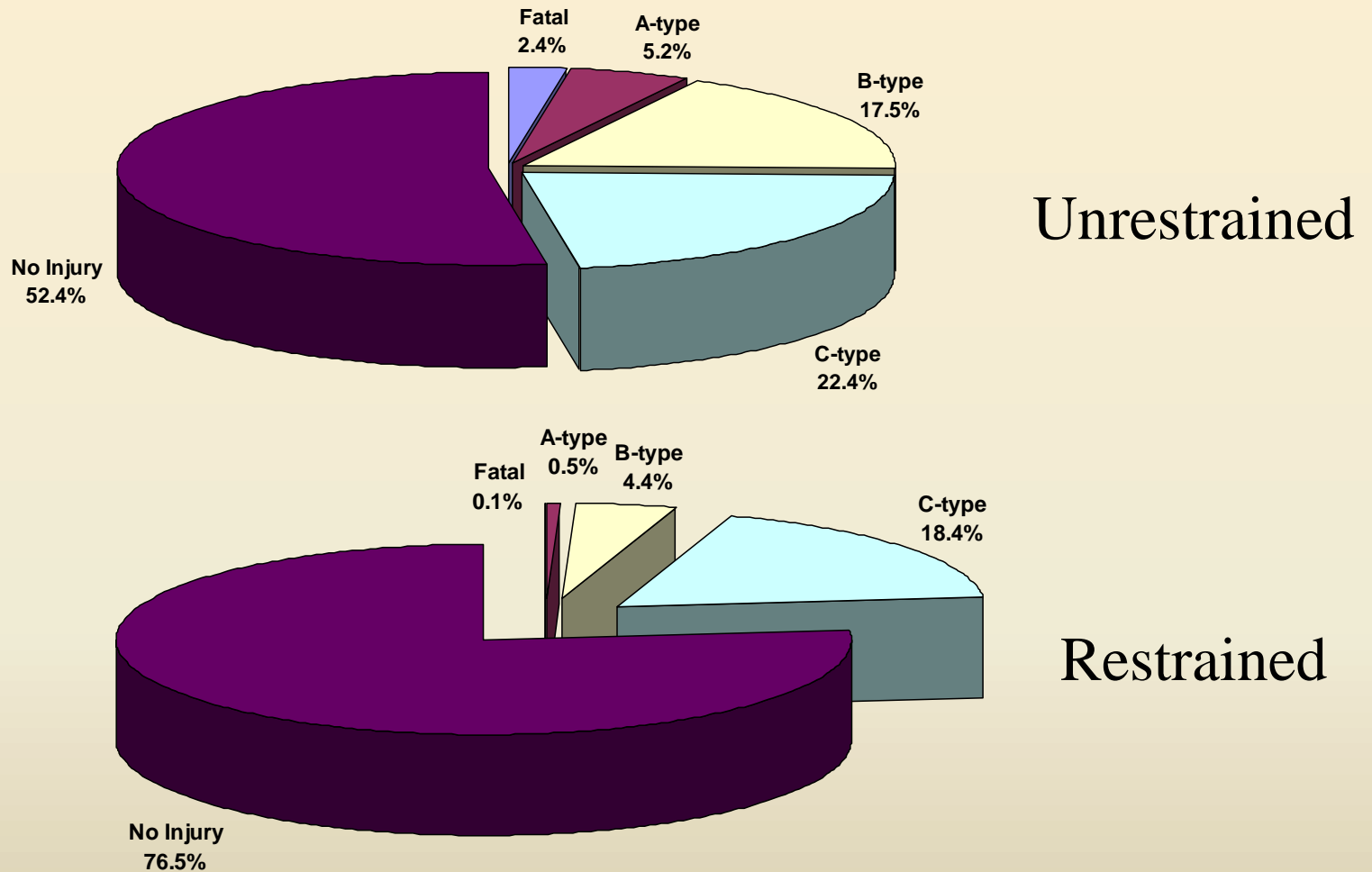
# Data Source

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## Data Analyzed from DMV-349 Collision Report Forms:

- Analyzed 2000 - 2002 data (3 year period)
- 95.4% Reported Usage vs. 86% Actual
- May need to investigate other sources for data
- In less severe and PDO crashes, reported use is inflated  
*(Occupants tell officer they were wearing their seat belt)*
- In Fatal and A Injuries reported numbers closer to actual  
*(especially fatal injuries; easier for the officer to verify)*

# Injuries to Passenger Vehicle Occupants



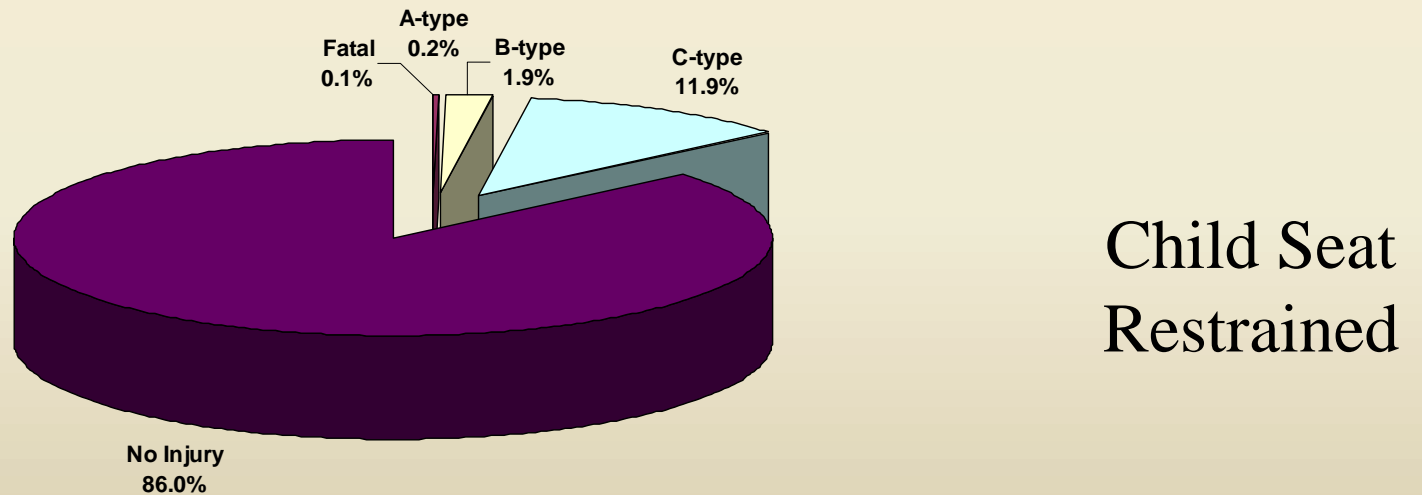
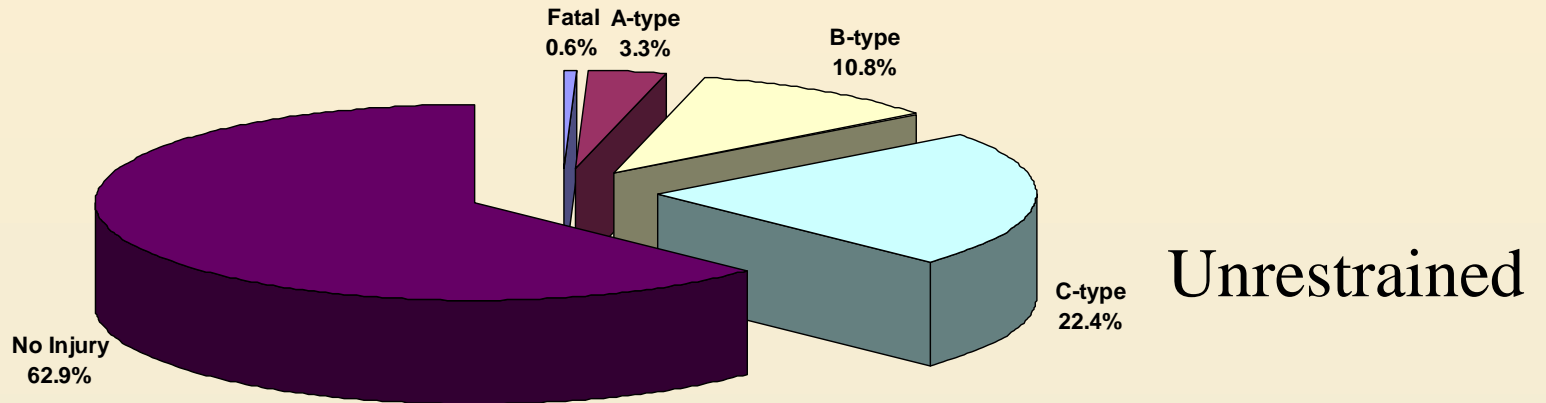
**10 Times More Likely to Suffer an A Injury if Unrestrained**  
**20 Times More Likely to be Fatally Injured if Unrestrained**

# Belt Use by Gender

		<u>MALE</u>			<u>FEMALE</u>	
Injury Level	Belt	No Belt	% Belted	Belt	No Belt	% Belted
K	877	1,237	41.5%	677	444	60.4%
A	3,703	2,522	59.5%	3,837	1,127	77.3%
B	31,821	8,206	79.5%	32,016	4,008	88.9%
C	113,680	8,887	92.7%	149,996	6,731	95.7%
O	610,179	24,326	96.2%	488,338	12,116	97.6%
Total	760,260	45,178	94.4%	674,864	24,426	96.5%

- Lower compliance among males
- Females more prone to fatal and A injuries when belted as compared to males

# Injuries to Passenger Vehicle Child Occupants



# Child Restraint Usage

AGE	NONE	Child Seat	Adult Restraint	All Restraints
> 1 YR	2.20%	89.60%	8.20%	97.80%
1 YR	4.14%	70.59%	25.27%	95.86%
2 YR	2.96%	82.95%	14.08%	97.04%
3 YR	3.63%	70.92%	25.45%	96.37%
4 YR	3.59%	50.17%	46.24%	96.41%

- Large percentage of children in adult restraints
- Small percent in proper child restraint at age 4
- Possible target areas for increased education?

# Belt Use by Age

Age	NO BELT	BELT	% BELTED
<5	2,192	63,218	96.6%
5-12	3,670	77,363	95.5%
13-15	3,443	36,720	91.4%
16-19	12,923	187,173	93.5%
20-29	21,110	349,035	94.3%
30-39	10,624	248,718	95.9%
40-49	6,899	191,855	96.5%
50-59	3,776	126,122	97.1%
60-69	1,972	70,831	97.3%
70>	2,445	72,318	96.7%
UNK.	668	12,430	94.9%
	69,722	1,435,783	95.4%

By Age

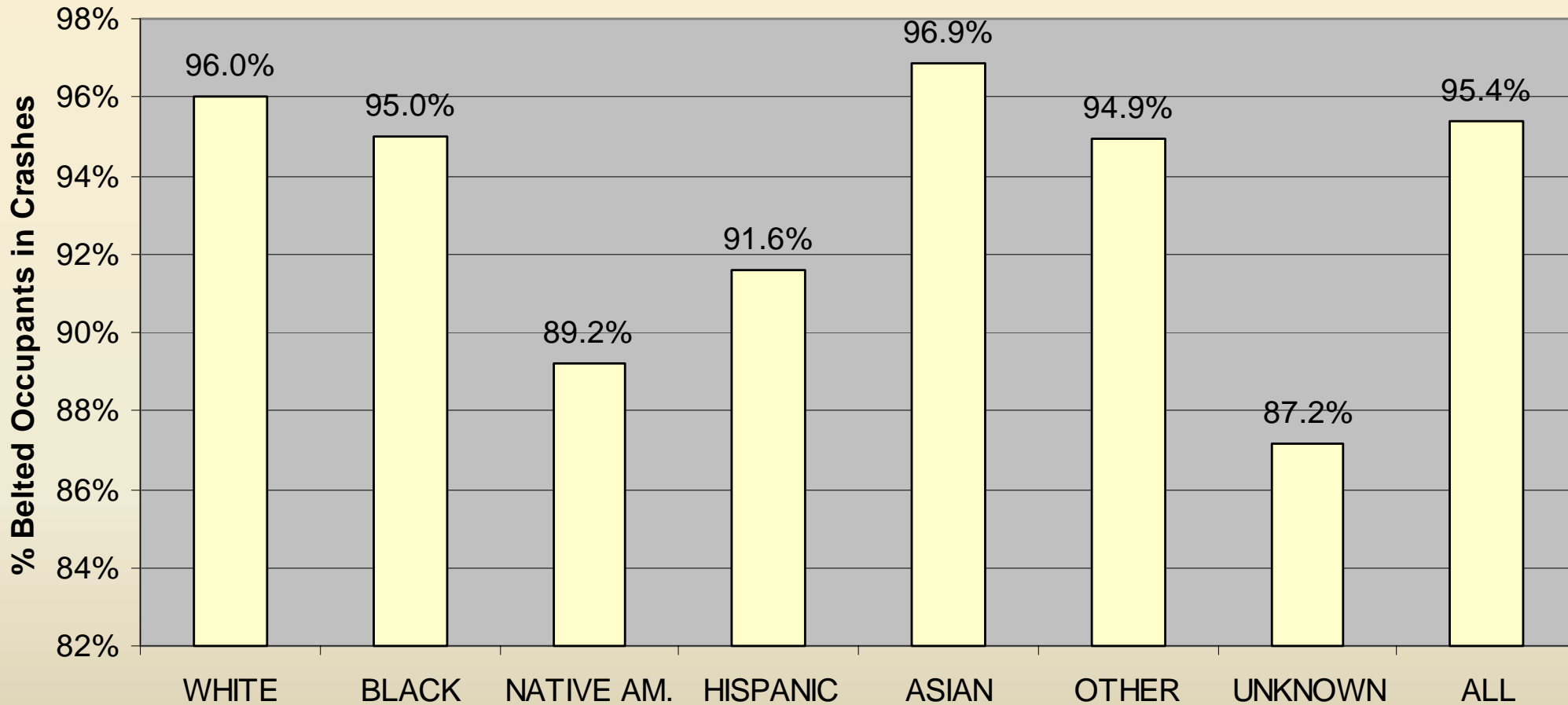
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By % Belted

- Lower compliance among younger occupants

# Belt Use by Race

Passenger Vehicle Occupant's Reported Belt Usage by Race





# Belt Use by Seating Position

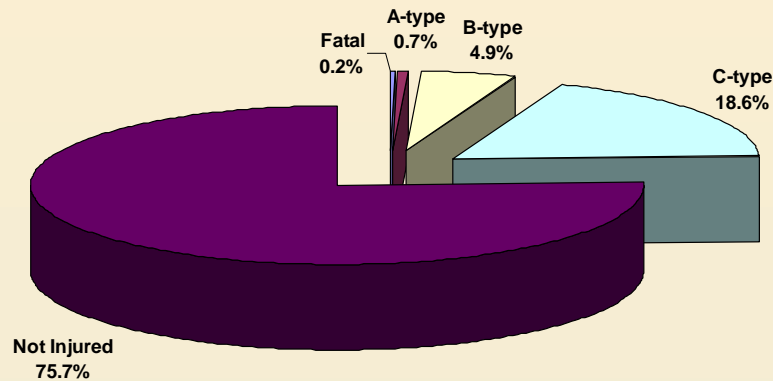
Injury Level	<u>LEFT FRONT</u>			<u>CENTER FRONT</u>			<u>RIGHT FRONT</u>		
	Belt	No Belt	% Belted	Belt	No Belt	% Belted	Belt	No Belt	% Belted
K	1,116	1,158	49.1%	3	12	20.0%	354	300	54.1%
A	5,536	2,079	72.7%	41	70	36.9%	1,537	821	65.2%
B	46,450	6,591	87.6%	295	229	56.3%	12,611	2,785	81.9%
C	179,401	5,840	96.8%	1,433	378	79.1%	56,712	2,860	95.2%
O	752,646	13,843	98.2%	6,607	973	87.2%	202,267	4,769	97.7%
<b>Total</b>	<b>985,149</b>	<b>29,511</b>	<b>97.1%</b>	<b>8,379</b>	<b>1,662</b>	<b>83.4%</b>	<b>273,481</b>	<b>11,535</b>	<b>96.0%</b>

Injury Level	<u>LEFT SECOND ROW</u>			<u>CENTER SECOND ROW</u>			<u>RIGHT SECOND ROW</u>		
	Belt	No Belt	% Belted	Belt	No Belt	% Belted	Belt	No Belt	% Belted
K	31	80	27.9%	6	31	16.2%	38	90	29.7%
A	165	222	42.6%	54	116	31.8%	194	304	39.0%
B	1,667	879	65.5%	525	438	54.5%	2,119	1,164	64.5%
C	9,392	2,178	81.2%	3,465	939	78.7%	12,072	3,071	79.7%
O	47,850	5,601	89.5%	20,068	2,546	88.7%	61,492	7,742	88.8%
<b>Total</b>	<b>59,105</b>	<b>8,960</b>	<b>86.8%</b>	<b>24,118</b>	<b>4,070</b>	<b>85.6%</b>	<b>75,915</b>	<b>12,371</b>	<b>86.0%</b>

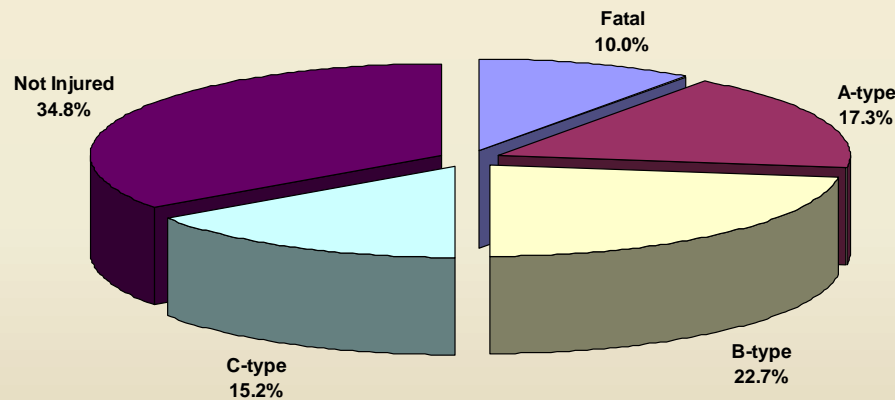
Injury Level	<u>LEFT THIRD ROW</u>			<u>CENTER THIRD ROW</u>			<u>RIGHT THIRD ROW</u>		
	Belt	No Belt	% Belted	Belt	No Belt	% Belted	Belt	No Belt	% Belted
K	2	5	28.6%	0	2	0.0%	4	3	57.1%
A	8	11	42.1%	1	12	7.7%	4	15	21.1%
B	81	54	60.0%	31	39	44.3%	73	40	64.6%
C	540	139	79.5%	252	105	70.6%	507	117	81.3%
O	3,366	424	88.8%	1,623	305	84.2%	3,144	342	90.2%
<b>Total</b>	<b>3,997</b>	<b>633</b>	<b>86.3%</b>	<b>1,907</b>	<b>463</b>	<b>80.5%</b>	<b>3,732</b>	<b>517</b>	<b>87.8%</b>

\*Note drop in compliance in second and third rows

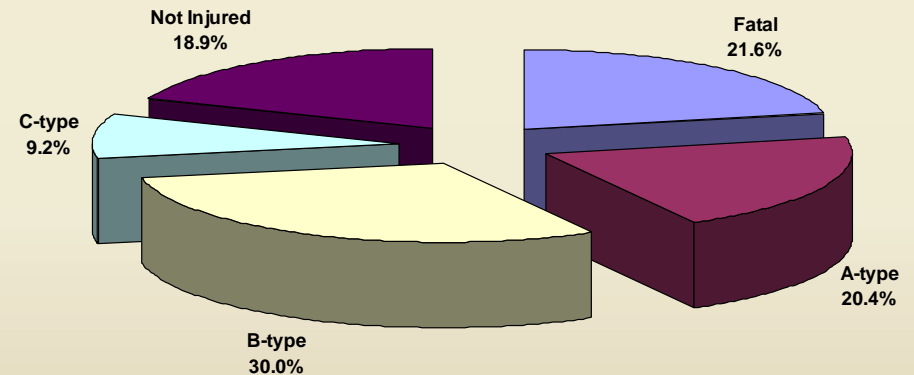
# Injuries: Ejected vs. Non-Ejected Occupants



Non-Ejected



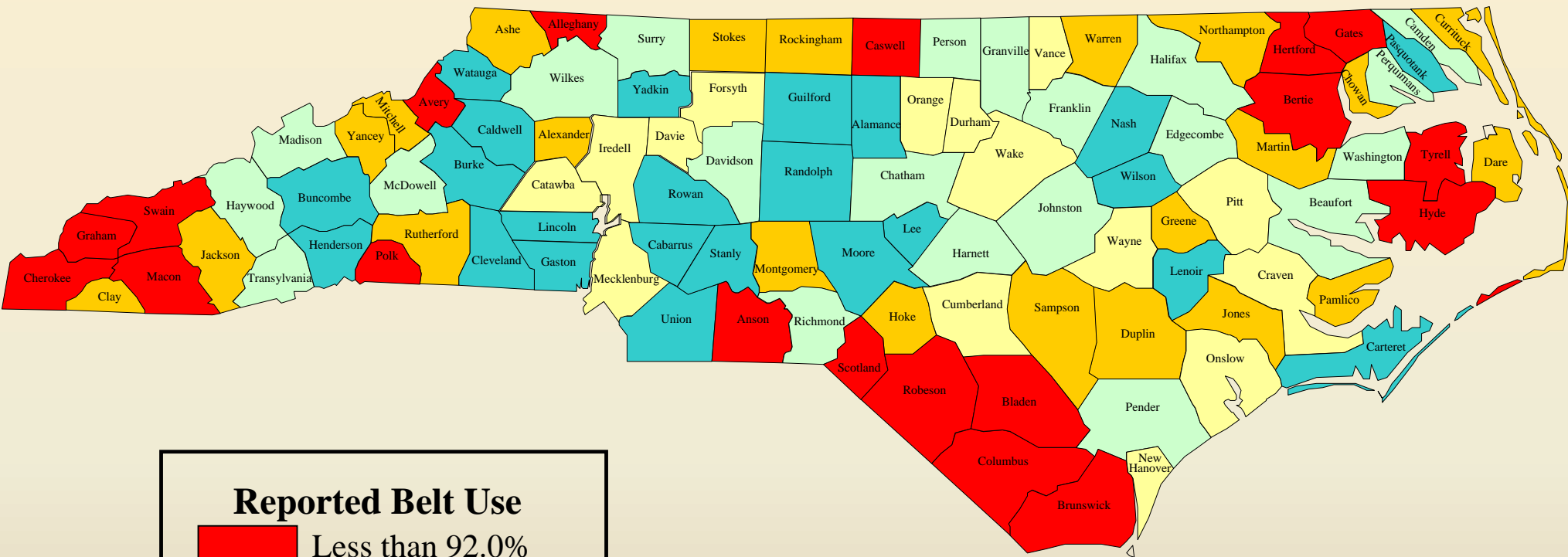
Fully Ejected



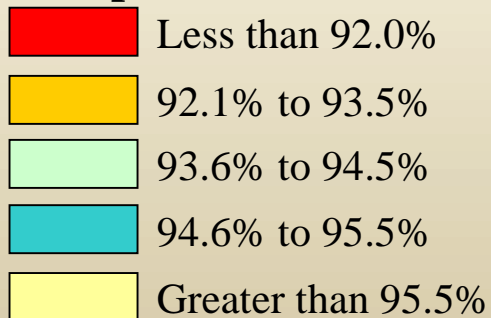
Partially Ejected

**Staying in vehicle results in less injury**

# Belt Use by County

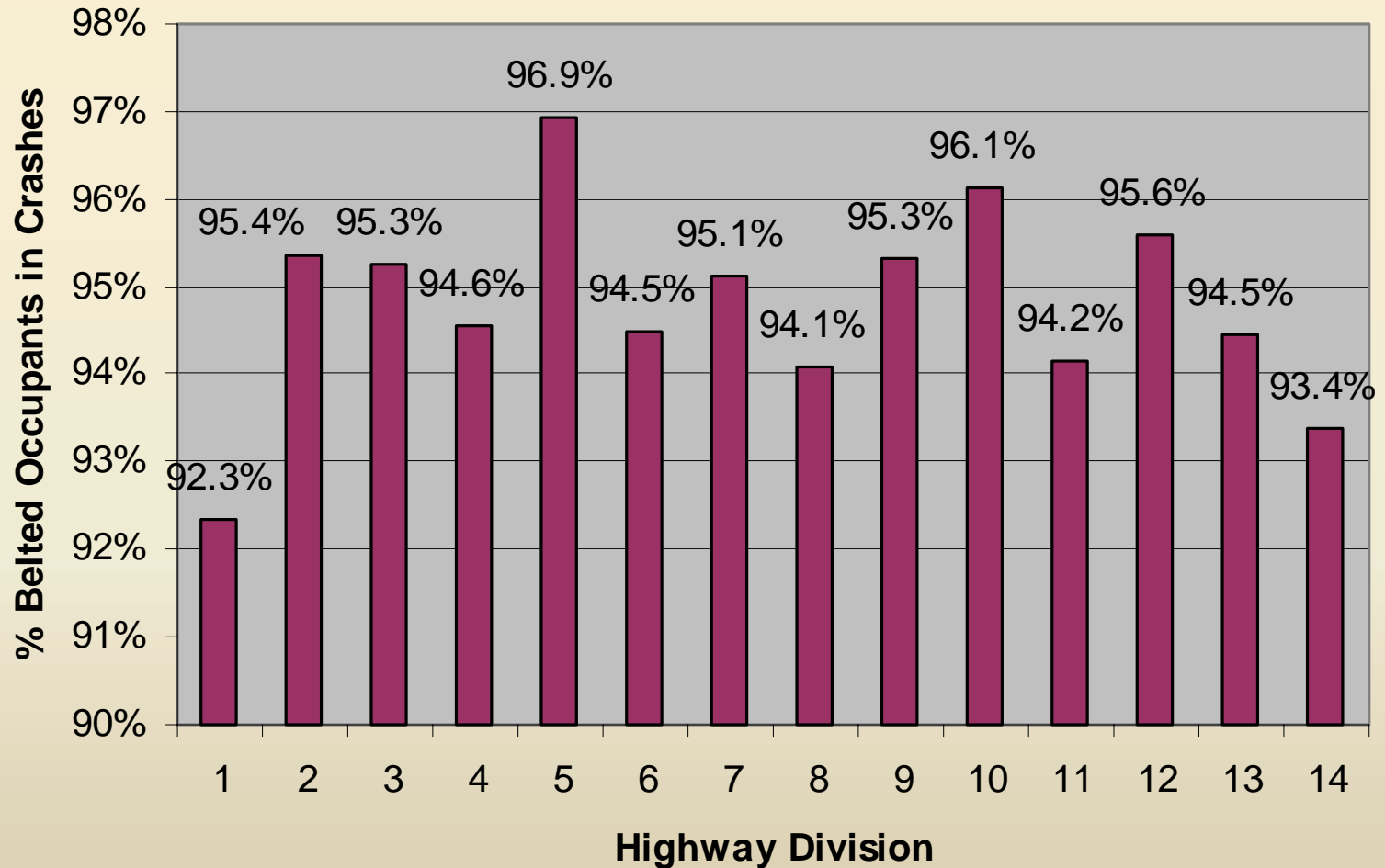


## Reported Belt Use



# Belt Use by DOT Division

## Passenger Vehicle Occupant's Belt Usage by Highway Division



**Lowest compliance in Division 1 (Coast) and Division 14 (Mountains)**

# Belt Use by State

Secondary Enforcement			Primary Enforcement			Secondary Enforcement			Primary Enforcement		
State	% Use	Fine	State	% Use	Fine	State	% Use	Fine	State	% Use	Fine
NH	-	-	WA	93	\$35	NH	-	-	OR	88	\$75
ME	-	\$50	CA	91	\$20	RI	71	\$57	DC	85	\$50
VT	85	\$25	HI	90	\$45	ME	-	\$50	NY	83	\$50
UT	80	\$45	OR	88	\$75	UT	80	\$45	TX	81	\$50
MN	80	\$25	NM	88	\$25	FL	75	\$30	HI	90	\$45
MT	78	\$20	MD	86	\$25	OH	70	\$25	WA	93	\$35
PA	76	\$10	DC	85	\$50	MS	62	\$25	NM	88	\$25
FL	75	\$30	NC	84	\$25	VT	85	\$25	MD	86	\$25
NV	75	\$25	NY	83	\$50	MN	80	\$25	NC	84	\$25
AZ	74	\$10	MI	83	\$25	NV	75	\$25	MI	83	\$25
CO	73	\$15	IA	82	\$10	WV	72	\$25	AL	79	\$25
WV	72	\$25	TX	81	\$50	VA	70	\$25	IL	74	\$25
RI	71	\$57	NJ	81	\$20	WY	67	\$25	IN	72	\$25
OH	70	\$25	AL	79	\$25	AR	64	\$25	LA	69	\$25
VA	70	\$25	CT	78	\$15	ID	63	\$25	CA	91	\$20
NE	70	\$25	GA	77	\$15	MA	51	\$25	NJ	81	\$20
MO	69	\$10	IL	74	\$25	NE	70	\$25	DE	71	\$20
WY	67	\$25	IN	72	\$25	KY	62	\$25	OK	70	\$20
TN	67	\$10	DE	71	\$20	MT	78	\$20	CT	78	\$15
AK	66	\$15	OK	70	\$20	SD	64	\$20	GA	77	\$15
SC	66	\$10	LA	69	\$25	ND	63	\$20	IA	82	\$10
WI	66	\$10				CO	73	\$15			
AR	64	\$25				AK	66	\$15			
SD	64	\$20				PA	76	\$10			
ID	63	\$25				AZ	74	\$10			
ND	63	\$20				MO	69	\$10			
MS	62	\$25				TN	67	\$10			
KY	62	\$25				SC	66	\$10			
KS	61	\$10				WI	66	\$10			
MA	51	\$25				KS	61	\$10			

Primary Enforcement states average 12% higher compliance.

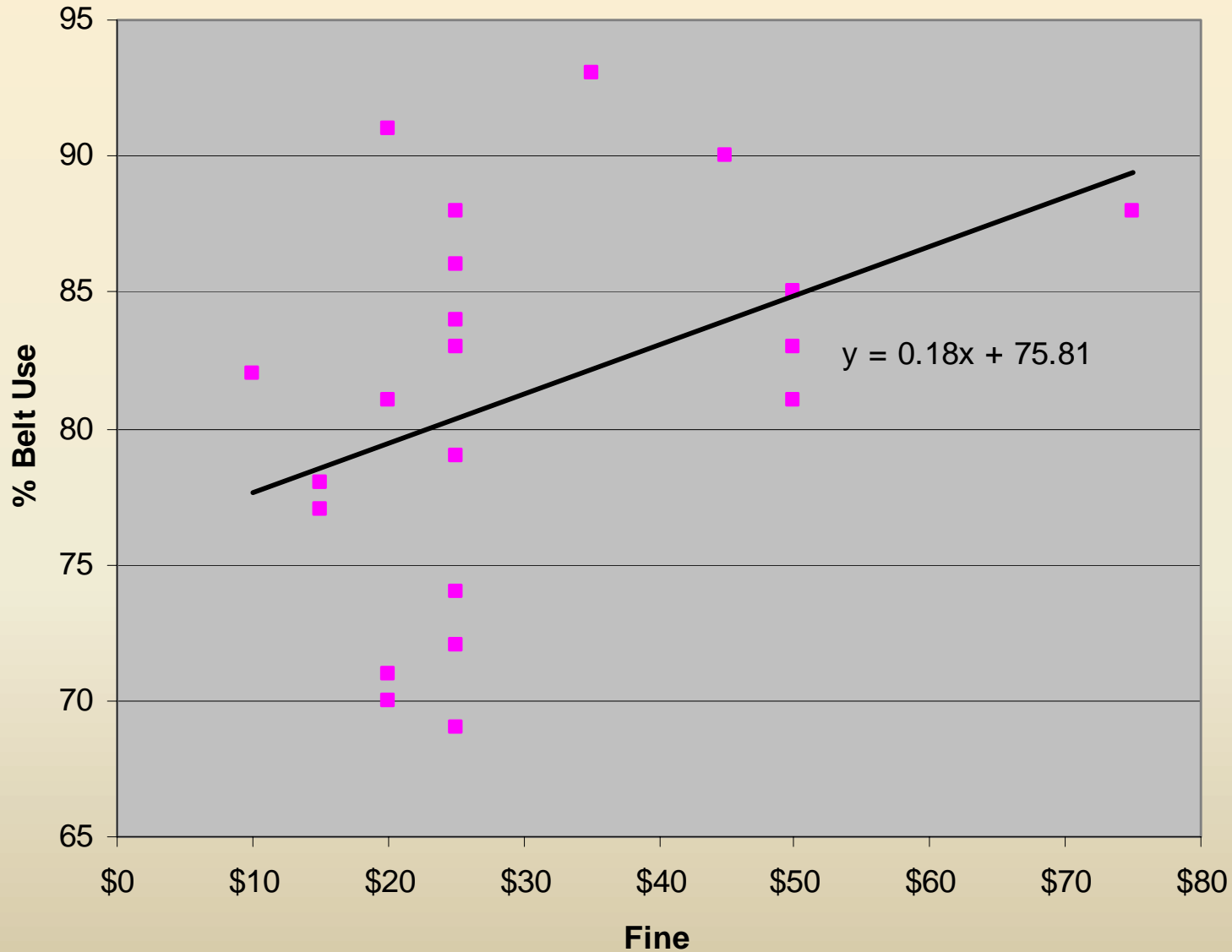
Ranked by % Use

Ranked by Fine

**Note: Primary enforcement states may initiate a vehicle stop for seat belt violations only. Secondary enforcement states must have other cause by which to initiate a vehicle stop.**

# Fine vs. Seat Belt Compliance

*(Primary Enforcement States)*



# Definition

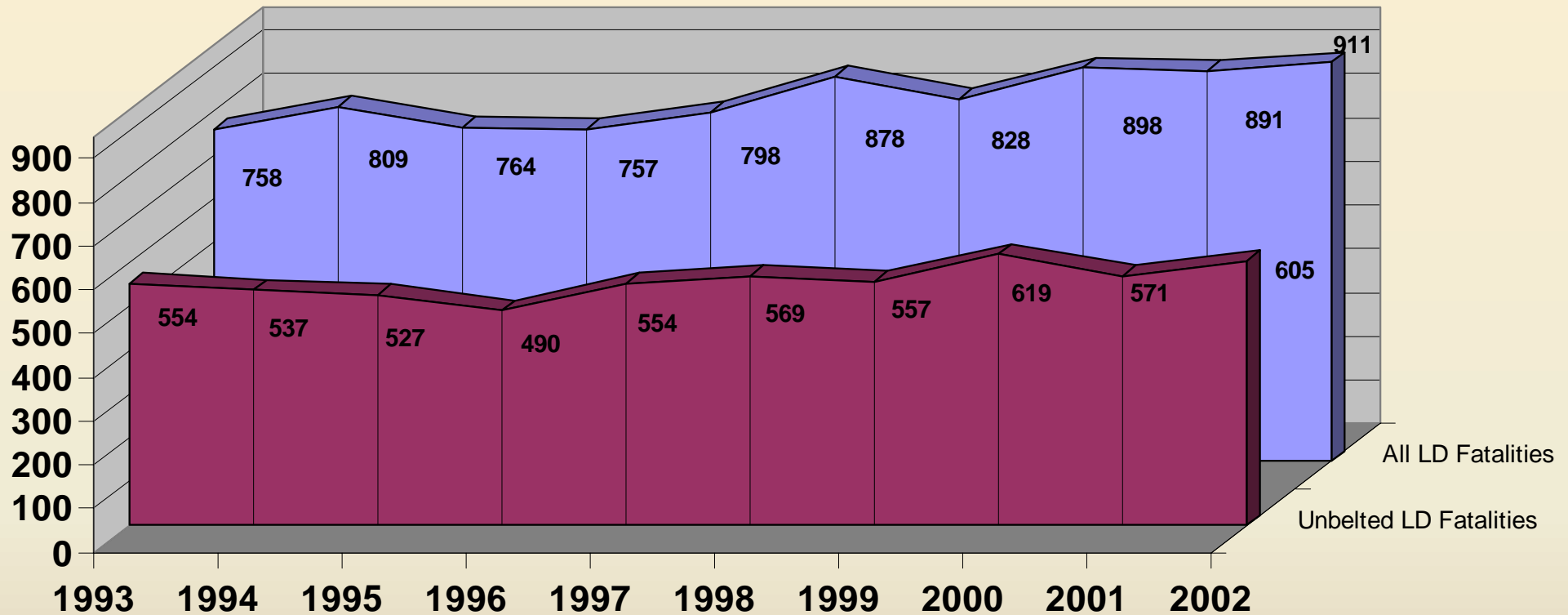
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## **Lane Departure Crashes include:**

- Ran Off Road - Left
- Ran Off Road - Right
- Ran Off Road - Straight
- Overturn/Rollover
- Fixed Object
- Head On
- Sideswipe, Opposite Direction

# Lane Departure Crashes

## (Fatal Crashes)



**On Average, Unbelted Occupants Account for  
68% of All Lane Departure Fatalities**



# Definition

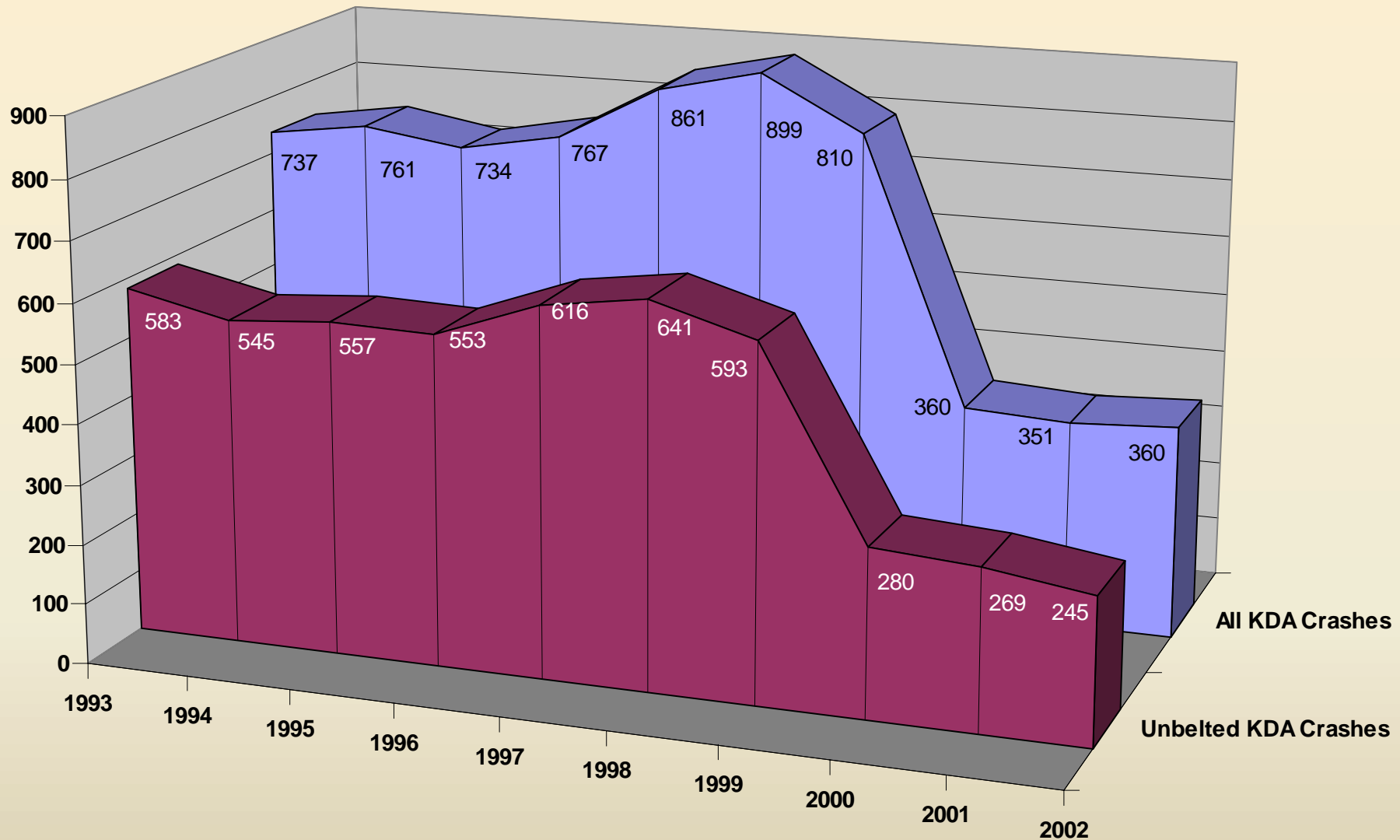
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## **Keeping Drivers Alert (KDA):**

- Where Driver's Physical Condition on the DMV-349 was noted as being anything other than "Apparently Normal"
- Includes:
  - Illness,
  - Fatigue,
  - Fell Asleep, Fainted, Loss of Consciousness,
  - Impairment due to Medications, Drugs, Alcohol,
  - Medical Condition,
  - Other Physical Impairment,
  - Restriction Not Complied With and
  - Other

# KDA Related Crashes

## (Fatal Crashes)



**On Average, Unbelted Occupants Account for  
74% of All KDA Related Fatalities**

# Definition

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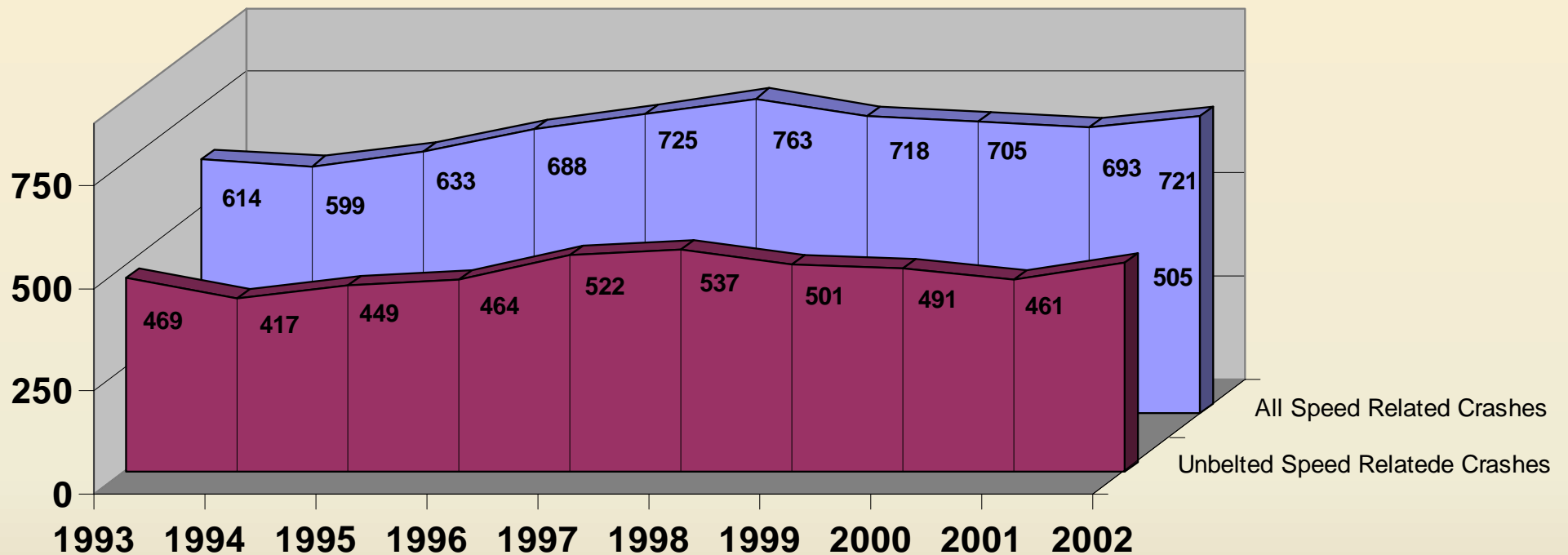
## **Speed Related Crashes include:**

- Exceeded Authorized Speed Limit
- Exceeded Safe Speed for Conditions
- Failure to Reduce Speed

*As noted on the DMV-349 N.C. Collision Report Form under  
“Contributing Circumstances”*

# Speed Related Crashes

## (Fatal Crashes)



**On Average, Unbelted Occupants Account for  
70% of All Speed Related Fatalities**